PRE-SALT CARBONATES DEFINE A NEW STRATIGRAPHIC MODEL FOR THE MESSINIAN SALINITY CRISIS IN THE CENTRAL MEDITERRANEAN (CALCARE DI BASE Fm, SOUTHERN ITALY)

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The Calcare di Base Formation (CdB) mostly (but not exclusively) represents a microbial-mediated carbonate body formed during Messinian and extending for more than 500 km across the Southern Italy, along the accretionary wedges of Calabria and Sicily Apennine chain. In these areas, the microbial carbonates, frequently associated with evaporites, are stratigraphically positioned at the onset of the Messinian Salinity Crisis, pre-dating the massive basinal sulphates and halite deposition in the Mediterranean Circum.

The CdB highlights a wide spectrum of different facies positioned along a prograding carbonate platform to slope system. The inner platform environments are characterized by sabkhas, flood-influenced salinas and peritidal mudflats, rich of planar to domal laminated microbial boundstones associated with evaporites, solution breccias and local cross-laminated detrital carbonates. Megabreccias with platform-derived clasts and a local siliciclastic input prevail in the upper slope, whereas debris flows and high-density turbidity currents occurred in the lower slope. Basinward, thinly laminated clay and marlstones associated to low-density turbidites characterize the outer-platform.

In a newly-proposed general sequential stratigraphic model of the Messinian Salinity Crisis, the carbonate platform systems represent a high-stand phase of at least two depositional cycles that follow one another. Each cycle begins with a relative sea-level fall responsible for the emplacement of prograding wedges composed of terrigenous and evaporitic deposits that, subsequently, evolve in the deposition of huge deposits of primary basin-fill evaporites. This latter phase is followed by open marine transgression due to relative sea-level rise that predates the development of another carbonate platform.

Despite the intense syn-sedimentary tectonic activity, responsible for huge basinward sediments exportation and fast decreasing in the accommodation space, the defined systems tracts succession has been mainly controlled by eustatic sea-level variations.